



RECONCEPTUALISING
MATHEMATICS
AND SCIENCE
TEACHER EDUCATION PROGRAMS

**Building recruitment pathways for high
quality mathematics and science teachers**

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Workshop plan

- What are we trying to achieve?
 - How have we addressed this need?
 - What do we know so far?
 - Q&A
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- Your input: What can push this agenda further?
 - Wrap up: What do we need to consider next?

What are we trying to achieve?

- The notion of pathway rather than pipeline
- The notion of high quality rather than high potential
- The crossing of boundaries between science and education
- Approaches need to be sustainable (can live on beyond the funding) and scalable (can stepped up to address quality across the profession)
- The role of outreach as part of mainstream education practices

How have we addressed this?

1. Unit for BSc students: *Schools science project*
2. Unit for MTeach students: *Engaging with practices of contemporary sciences*
3. Connecting PSTs with scientists
4. Science in Schools

BSc unit: *Schools science project*

- **10 day school placement:**

Students research, develop, manage and deliver a science based module that matches the learning outcomes specified to them by their client.

- **Generic skills for workplace:**

- Interpret client brief
- Manage expectations, schedules, resources, risks,
- Assessment of own understanding of science
- Use of feedback for learning



MTeach unit: *Engaging with practices of contemporary sciences*

The unit

- Preservice and inservice teachers
- Frame - 5 levels of cognitive engagement for analysing authentic science practices
- Uses existing Monash University STEM activities/outreach/programs

Outcomes

- Rethinking their personal view of the Nature of science/maths based on analysing current sciences practices
- Translating this new understanding into practical outcomes for the classroom – and seriously addresses science as a human endeavour

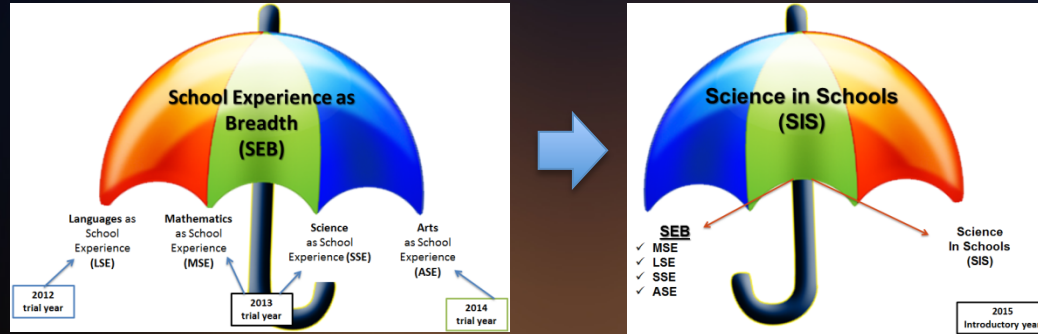
EDF5674 : Engaging with practices of contemporary science



Connecting PSTs with scientists

- **Community Science Project — a B.Sc. unit:**
 - Students interact with industry/community organisations on a science project.
 - ReMSTEP links with the museum enable students to interact with museum scientists to develop digital resources.
- **Biology Methods students construct digi-explanations:**
 - Biology method students interview scientists to develop multi media resources around aspects of contemporary biology for schools
- **Chemistry Methods students develop contemporary science resources:**
 - Chemistry methods students work one-on-one with research science PhD students to interpret their research and develop school resources
- **Communicating Science students interpret science research:**
 - Science communication students translate a scientist's description of their work into a resource suitable for use by school students in the classroom

Science in schools subject



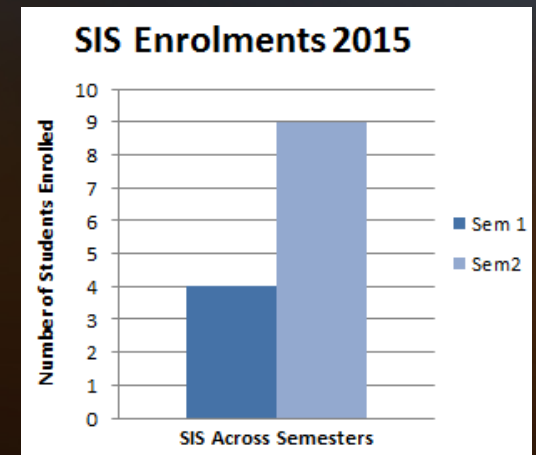
Collaborative venture between UoM's MGSE & the Faculty of Science

- Team of academics design and deliver the subject content
- Schools provide opportunities for Tertiary Student Assistants (TSA) to support student learning in schools

- Students undertake **volunteer experience** of **20 hours**

These experiences are aimed to:

- enhance students breadth of education and employability skills
- support students' development of critical understandings and the nature of citizenship and volunteering
- embed learning in real world contexts



What do we know so far?

Students in schools:

- Students love it, and ask for more
- Schools cry for help with science:
 - University students bring fresh science to schools
 - Teachers learned new science (PD)
 - Appreciated access to equipment
- Students came prepared with equipment, were professional, adaptable, respectful
- Translating contemporary science into school activities can require high level skills and needs support

What do we know so far?

PST-ISTs interacting with scientists:

- Can be highly beneficial for pre-service teachers but the interaction needs to be properly framed
- PhD science research students are a productive link to the science research community as the experience can be valuable for them as an opportunity to both communicate their science and to develop their science communication skills.
- For rethinking of our view on the Nos/Nom there needs to be sustained support for analysing contemporary practices

What do we know so far?

- ReMSTEP has opened up a suite of productive interactions between science and education that we expect will be ongoing
- There is a real appetite for collaborative efforts between schools and with universities
- There is a lot of goodwill in the science community for collaborations with educators including PSTs
- There are many KPIs for outreach programs within the science community that can be 'hooked' into

Questions?

Workshop

What can push this agenda further?

What other pathways should be explored for high quality science and maths teachers that enable crossing boundaries, are sustainable and are scalable?

*Each table to discuss
and present major idea(s)*